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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,927	03/30/2001	Mary Anne Alvin	01P05781US	8322

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EXAMINER

MCHEMRY, KEVIN L

ART UNIT

PAPER NUMBER

1725

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/822,927	Applicant(s) ALVIN, MARY ANNE
	Examiner Kevin L McHenry	Art Unit 1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 32-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 12-15, 17-19 and 21-29 is/are rejected.
- 7) ☒ Claim(s) 9, 11, 16, 20, 22 and 30 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/30/01</u> . | 6) <input type="checkbox"/> Other: ____. |

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-31, drawn to a gas separation membrane, classified in class 422, subclass 211.
 - II. Claims 32-36, drawn to a method of separating hydrogen gas, classified in class 95, subclass 55.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus can be used for a different process, such as separating different, non-hydrogen gases, or to remove particulates from gas.
3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Erik Swanson on 17 February 2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-31. Affirmation of this election must be made by applicant in replying to this Office action. Claims 32-36 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 520, 524, 820, and 824. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claim 17 is provisionally rejected under the judicially created doctrine of double patenting over claims 1-3 of copending Application No. 10/669,845. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that

compending application since the referenced compending application and the instant application are claiming common subject matter, as follows: a gas separation membrane composed of a porous body and a catalytic material wherein the porous body is composed of metal fibers or metal powder bonded together.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other compending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

8. Claims 1, 2, 4, 6, 12, 17, 19, 23, 24, and 31 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 6, 12, 14, 15, 18-20, and 24 of U.S. Patent No. 6,630,423 in view of Eyraud et al. (U.S.P. 3,022,187).

Claims 1, 6, 12, 14, 15, 18-20, and 24 of U.S.P. 6,630,423 teach the same invention claimed in present claims 1, 2, 4, 6, 12, 17, 19, 23, 24, and 31 except for a diffusion coating.

Eyraud et al. teach a separation membrane in which a metal layer is applied to the surface of the membrane to provide better surface cohesion and wear resistance. (see U.S.P. 3,022,187; Figure; column 1, lines 46-50).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the invention cited in the claims of 6,630,423 by the teachings of Eyraud et al. One would have been motivated to do so in order to provide a metal diffusion coating for better surface cohesion and wear resistance, as taught by Eyraud et al.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Anderson et al. (U.S.P. 5,342,431).

Anderson et al. teach a gas separation membrane that includes a porous ceramic or metal support body that is composed of particulate powder. The body has a first surface and a second surface with the porosity of the body increasing from the first surface to the second surface. The body also has a diffusion coating on the first for receiving a gas stream. The increase in porosity is due to an increase in the size of the particles. Because of the increase in particle size, there is a corresponding decrease in compaction between the particles. (see U.S.P. 5,342,431; Figure 2; column 5, lines 51-68; column 6, lines 1-15, 29-41; column 8, lines 27-36).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 6-8, 10, 12-15, 17-19, 21, 23-25, 27-29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (U.S.P. 5,342,431) as applied to claims 1-3 above, and further in view of Abe (U.S.P. 4,865,630).

The former references teaches the membrane noted in section 10. However, this reference does not teach the use of a catalyst or a support structure for the membrane.

Abe teaches a gas separation membrane that includes a ceramic support body and a catalytic component that may include platinum or palladium. The membrane can be composed of multiple layers with the porosity increasing from a first surface to a second surface. Catalytic particles can be included in the first surface or the second surface of the support body. Abe demonstrates that a support structure for the membrane may be a perforated plate constructed so that the membrane will pass through the plate and be adjacent to the plate. Abe teaches that this membrane design enhances the efficiency of separation without a loss of pressure in the gas passing through the membrane and clogging of support members. (see U.S.P. 4,865,630; Figures 2, 4, and 6(b); column 1, lines 7-23, 44-68; column 2, lines 1-15, 55-62; column 3, lines 1-48, 64-68; column 4, lines 1-25; column 5, lines 22-26).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the membrane described above by the teachings of Abe. One would have been motivated to do so in order to enhance separation efficiency without a loss of gas pressure and clogging of support members, as taught by Abe. The examiner notes that Anderson et al. teach the equivalence of ceramic and metallic porous bodies.

13. Claims 1-8, 10, 12, 13-15, 17, 18, 20, 21, 23, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyraud et al. (U.S.P. 3,022,187) in view of Abe (U.S.P. 4,865,630) and Anderson et al. (U.S.P. 5,342,431).

Eyraud et al. teach a membrane composed of sintered metal with a metal diffusion coating. Eyraud et al. teach that pores of the metal porous body are filled with a ceramic material near the coated first surface, with the amount of filling by ceramic material diminishing with depth. This creates a gradient in porosity that increases with depth from the coated surface. (see U.S.P. 3,022,187; Figure; column 1, lines 35-58, 64-71; column 2, lines 3-31).

Eyraud et al. do not teach the use of a catalytic material or a support structure for the membrane.

Abe teaches a gas separation membrane that includes a ceramic support body and a catalytic component that may include platinum or palladium. The membrane can be composed of multiple layers with the porosity increasing from a first surface to a second surface. Catalytic particles can be included in the first surface or the second surface of the support body. Abe demonstrates that a support structure for the membrane may be a perforated plate constructed so that the membrane will pass through the plate and be adjacent to the plate. Abe teaches that this membrane design enhances the efficiency of separation without a loss of pressure in the gas passing through the membrane and clogging of support members. (see U.S.P. 4,865,630; Figures 2, 4, and 6(b); column 1, lines 7-23, 44-68; column 2, lines 1-15, 55-62; column 3, lines 1-48, 64-68; column 4, lines 1-25; column 5, lines 22-26).

Anderson et al. teach a gas separation membrane that includes a porous ceramic or metal support body that is composed of particulate powder. The body has a first surface and a second surface with the porosity of the body increasing from the first surface to the second surface. (see U.S.P. 5,342,431; Figure 2; column 5, lines 51-68; column 6, lines 1-15, 29-41; column 8, lines 27-36).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the membrane described above by the teachings of Abe and Anderson et al.. One would have been motivated to do so in order to enhance separation efficiency without a loss of gas pressure and clogging of support members, as taught by Abe. The examiner notes that Anderson et al. teach the equivalence of ceramic and metallic porous bodies. Therefore, it would have been obvious to one of ordinary skill in the art to have used a metal porous body, as taught by Anderson et al., instead of the ceramic porous body taught by Abe in light of the art recognized functional equivalence of metal and ceramic porous bodies (i.e. both are suitable materials for a porous membrane body).

Allowable Subject Matter

14. Claims 9, 11, 16, 20, 22, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: the instant application is deemed to be a nonobvious improvement over Abe (U.S.P. 4,865,630) and Eyraud et al. (U.S.P. 3,022,187). The improvements comprise a

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ceramic-base washcoat opposite the chemisorption-dissociation-diffusion coating with a layer of catalytic material disposed on the washcoat, coating of catalytic material disposed on the outer surfaces of the metal particles of the porous body, and a metal mesh or perforated metal plate support structure that extends through the transmission member.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Abe et al. (U.S.P. 4,689,150) is cited of interest for illustrating the state of the art in separation membranes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin L McHenry whose telephone number is (571) 272-1181. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin McHenry

Kiley Stoner AU 1725
Kiley Stoner 3/22/04